THERMAL SENSOR DEVICE

DESCRIPTION

OBJECT OF THE INVENTION

The present invention refers to a sensor device that reacts to changes of temperature as the materials that form the device are deformed.

The purpose of the invention is a device that allows abrupt changes of temperature within short periods of time to be detected, activating any warning device, indicator or activator, such as buzzers, alarms, luminous indicators, extinguisher activators, etc.

BACKGROUND TO THE INVENTION

At the state of the technique the existence of sensor devices is known which react to sudden changes of temperature that have their principal application in detecting fires in a given place, so that, on having detected a given increase of temperature, the device reacts giving an alarm indication.

These temperature sensor devices are also used in the detection of abnormal increases of temperature in facilities that have cabinets with electronic or electrical equipment.

Thus, at the level of the technique we find devices such as that presented in the European patent EP 351.050 that describes an ultrasonic temperature detector that has a wave guide that is arranged in such a way that the local warming caused by a fire changes its acoustic impedance, in the area where the warming has occurred.

On the other hand, in the document EP 821.468 a system to control the temperature of an electronic component, that includes a thermal strip temperature detector, is shown.

DESCRIPTION OF THE INVENTION

The temperature sensor device that is proposed refers to a sensor that reacts to changes of temperature as the materials that form the device are deformed, allowing sudden changes of temperature in short periods of time to be detected, activating any warning device, indicator or activator, such as buzzers, alarms, luminous signals, fire-extinguishers activators, etc.

One of its principal applications is for example that of detecting fires in a given enclosure or building, so that, on having detected a predetermined increase in temperature, the device reacts giving an alarm signal.

These temperature sensor devices can also be used in the detection of abnormal increases of temperature in facilities that have cabinets with electronic or electrical equipment.

The body of the device comprises at least two equal parts, called shells, of cylindrical section in their central area and of spherical section in the sides, having an outlet channel in one of the sides. After these two shells join with each other, an internal hollow, that provides an outlet channel through one of the ends of the device, is formed.

In the interior face of the shells, a number of tiered cylindrical ledges have been envisaged, preferably equidistant, that include a number of blind apertures for the coupling of the shells. Said cylindrical ledges are arranged so that at least one is close to the near end of the outlet channel, at least another at the opposite end and at least another in the central zone.

In addition, there is a large number of bolts, as many as cylindrical ledges, which have a cylindrical shape with the ends rounded, that are tightly introduced into the blind orifices of the cylindrical ledges, allowing the coupling of the shells.

In the internal hollow the device has a structure, preferably rectangular, of section, preferably circular. Said structure can have at least one bolt, so that it is positioned in the central part of one of the side branches in the case that the structure is rectangular. This bolt could be integral with the structure or be detachable. The end of the structure where the bolt is positioned will preferably be located at the end close to the outlet channel.

In addition, at the opposite end to that of the bolt, said structure has an electrical terminal, preferably metallic. To said electrical terminal a conductive medium is joined through a connecting element, preferably by welding, in a way that said conductive medium emerges outside of the internal hollow between shells through the output channel.

In the blind apertures of the cylindrical ledges located in the central zone of the shells, both sides of the bolt are tightly introduced, so that it allows the distance between shells in the central zone of the device to be maintained.

In the blind aperture located at the opposite end to that in which the bolt positioned in the structure has been inserted, another bolt is placed whose central part has a metallic end of an electrical terminal, preferably metallic.

To said electrical terminal a conductive medium is joined through a connecting element, preferably by welding, in a way that said conductive medium emerges outside of the internal hollow between shells through the outlet channel.

In this way, the two electrical terminals would remain positioned at a definite distance, it being envisaged that this distance will vary as a function of the temperature, because of the property of dilation of the plastic components that form the appliance, in such a way that on reaching a given critical temperature, contact between both terminals is produced, closing the

circuit and activating any warning device, indicator or activator, such as buzzers, alarms, luminous signals, extinguisher activators, etc.

The distance between the electrical terminals is planned according to the coefficients of dilation or of deformation that the prime material of the components that make up the device have, as well as of the critical temperature for giving the alarm signal. In this way, the distance between the electrical terminals will be tabulated according to the prime material used in the manufacture of the components of the device, likewise of the characteristics of the means of control.

The prime material used in the manufacture of the components of the devices has to ensure that all the components have the same characteristics so that they react in the same way when being subjected to the same increase in temperature, that is, that they undergo the same process of deformation when subjected to the same temperature change.

The prime material used in the manufacture of the components could be plastic, so that all the components of the device are obtained from a base of a single mould or moulding operation, so that they have the same characteristics.

All these components must be carried out in a high precision process, as regards dimensions, since the reaction of the device depends on the relative position between components.

DESCRIPTION OF THE DRAWINGS

To supplement this description and with the aim of leading to a better understanding of the characteristics of the invention, in accordance with a preferred example of its practical embodiment, as an integral part of this description it is accompanied by a set of drawings where in an illustrative and non-limiting way, the following have been represented:

Figure 1.- Shows a plan schematic representation of the

temperature sensor device, with the two shells uncoupled.

Figure 2.- Shows a representation of the rectangular structure in perspective.

Figure 3.- Shows a blow-up schematic representation of the temperature sensor device, connected to the warning device.

Figure 4.- Shows a elevation schematic representation of the temperature sensor device, connected to the warning device.

PREFERABLE EMBODIMENT OF THE INVENTION

According to the drawings shown, the body of the device is formed by two shells (2), of cylindrical section in their central area and of spherical section in the sides, having an outlet channel (6) in one of the sides. After these two shells are coupled with each other, like a bulb, an internal hollow (7) is formed, that has an outlet channel through one of the ends of the device (1).

In the interior face of the shells (2), a number of tiered cylindrical ledges have been envisaged, preferably equidistant, that comprises a number of blind apertures (4) for coupling said shells (2). Said cylindrical ledges (3) are arranged so that at least one is close to the near end of the outlet channel (6), at least another at the opposite end and at least another in the central zone.

On the other hand a large number of bolts (5) are positioned, as many as cylindrical ledges (3), which have a cylindrical shape with the ends rounded, that are tightly introduced into the blind orifices (4) of the cylindrical ledges (3), allowing the shells (2) to be coupled.

In the internal hollow (7) the device (1) further comprises a structure (8), preferably rectangular, of section, preferably circular. Said structure (8) can have at least one bolt (5), so that it is positioned in the

central part of one of the side branches in the case that the structure (8) is rectangular. It will be possible for this bolt (5) to be integral with the structure (8) or to be detachable. The end of the structure (8) where the bolt (5) is positioned will, preferably, be located at the end close to the outlet channel (6).

In addition, at the opposite end to that of the bolt (5), said structure (8) has an electrical terminal (9), preferably metallic. To said electric terminal (9) a conductive medium (10) is joined through a junction element, preferably by welding, so that said conductive medium (10) emerges out from the internal hollow (7) between shells (2) through the outlet channel (6).

In the blind orifices (4) of the cylindrical ledges (3) located in the central zone of the shells (2), both sides of the bolt (5) are tightly introduced, so that it allows the distance between shells (2) in the central zone of the device (1), to be maintained.

In the blind orifice (4) located at the opposite end to that into which the bolt (5) of the structure (8) is positioned, another bolt (5) is positioned, in whose central part there is an electrical terminal (9), preferably metallic. To said electric terminal (9) a conductive medium (10) is joined through a junction element (11), preferably by welding, so that said conductive medium (13) emerges out from the internal hollow (7) between shells (2) through the outlet channel (6).

In this way, the two electrical terminals (9) would remain closely positioned, at a given distance (12) that will vary as a function of the temperature (14), due to the property of dilation of the plastic components that form the device (1), so that on reaching a given critical temperature (14) the contact between both electrical terminals (9) is produced, the circuit closing and activating any warning device (13) such as buzzers, alarms, luminous signals, extinguisher activators, etc.

The distance (12) between the electrical terminals (9) is planned

according to the dilation or deformation coefficients of the prime material of the components that comprise the device (1), as well as according to the temperature (14) critical to give the alarm signal. In this way, the distance (12) between the electrical terminals (9) will be given as a function of the prime material used in the manufacture of the components of the device (1), likewise of the characteristics of the environment to be controlled.

The prime material (15) used in the manufacture of the components of the device (1) has to ensure that all the components have the same characteristics in order that they react in the same way on being subjected to the same increase of temperature (14), that is, that undergo the same process of deformation for the same changes of temperature (14).

It will be possible to use plastic as the prime material (15) used in the manufacture of the components so that all the components of the device (1) are obtained from a single mould or moulding operation, so that they have the same characteristics.

All these components must be accomplished in a process of great precision as regards dimensions, given that the reaction of the device (1) depends on the relative position between components.